

R. C. Bushland

November 16, 1951

To: E. F. Knipling, In Charge, Division of Insects
Affecting Man and Animals, Washington, D. C.

From: A. L. Smith, P. O. Box 246, Umatilla, Fla.

Subject: Horn Fly Tests with DDT

The tests which you requested in August to determine whether horn flies have become resistant to DDT have been completed and a report on the tests is transmitted herewith.

I regret the delay in getting this report out but, on account of pressing duties in connection with screw worm research and surveys, I was unable to complete it sooner.

ALSmith:gef

Enclosures - 1

cc. R. C. Bushland ✓
Gaines Eddy

November 13, 1951

Resistance Test of Horn Flies to DDT

A. L. Smith

Tests were begun August 21, 1951 in Florida to determine if horn flies have developed any resistance, or tolerance, to DDT.

As far as possible these tests were duplications of the original tests made with DDT in 1946 against horn flies.

Each test evaluated in this report was conducted on the same ranch and under the same general conditions as in 1946. The same formulation and the same brand of DDT was used in the 1946 and 1951 tests. Only 50% wettable powder was used.

Comparative results are made from copies of reports made on the 1946 tests. For various reasons only four of the original tests could be duplicated. Three of these were conducted and evaluated by A. L. Smith and one by C. C. Skipper, which are all evaluated separately and attached hereto.

These tests do not indicate in any way that horn flies are any more resistant to DDT after having been sprayed regularly with DDT for a period of five years.

Some of the cattle in these tests have been sprayed with DDT as many as twenty-five times since the original tests in 1946.

T. Noble Brown, Cooperator,
Webster, (Sumter County) Florida

The cattle used in this test were large, purebred Herefords, mostly cows and calves. Fifty-two head were sprayed on August 21, 1951 with a power sprayer, using 2.3% DDT, at the rate of slightly over 1-pint per head, 58 pints being used on 52 cattle. The actual DDT applied per animal was 11.47 grams. Horn fly population was estimated at about 400 flies per animal.

Inspection of cattle for fly counts were made on August 27, September 7, September 17, and September 24. Up to September 7, or 17 days after treatment, no flies were seen on any of the test cattle. On September 17 the fly count averaged about 1 fly to each 5 cattle. On the final inspection of September 24 the fly count was still about the same as the previous week.

Almost complete protection against horn flies for more than one month was obtained by this treatment as compared with two weeks in 1946. The difference being that in 1946 the cattle were exposed to reinfestation by a herd of untreated cattle adjoining the test herd. This time the cattle in the adjoining pasture were sprayed with DDT the same day as the test herd. Other conditions were quite similar to that of 1946.

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Some of the cattle in these tests have been sprayed with DDT as many as twenty-five times since the original tests in 1946.

T. Noble Brown, Cooperator,
Webster, (Santer County) Florida

The cattle used in this test were large, purebred Herefords, mostly cows and calves. Fifty-two head were sprayed on August 21, 1951 with a power sprayer, using 2.5% DDT, at the rate of slightly over 1 pint per head. 28 pints being used on 25 cattle. The actual DDT applied per animal was 11.17 grams. Horn fly population was estimated at about 400 flies per animal.

Inspection of cattle for fly counts were made on August 27, September 7, September 14, and September 24. Up to September 7, or 17 days after treatment, no flies were seen on any of the test cattle. On September 17 the fly count averaged about 1 fly to each 2 cattle. On the final inspection of September 24 the fly count was still about the same as the previous week.

Almost complete protection against horn flies for more than one month was obtained by this treatment as compared with two weeks in 1946. The difference being that in 1946 the cattle were exposed to reinestation by a herd of untreated cattle adjoining the test herd. This time the cattle in the adjoining pasture were sprayed with DDT the same day as the test herd. Other conditions were quite similar to that of 1946.

In the 1946 test the rapid build-up in fly population as soon as the residual action failed to kill flies readily was due to the heavy infestation in the adjoining pasture. In 1951, exposure was eliminated by spraying the other cattle. The entire fly population was killed out since the residual action of the spray was longer than the life cycle of the flies.

During both tests the cattle were kept in a small improved pasture provided with adequate shade from large oak trees to protect the cattle against hot sun. The weather was very hot and there was not much rain during the test.

R. E. McDonald, Cooperator
Samsula, (Volusia County) Florida

Cattle used in this test were rather small grade Angus. Eighteen head were sprayed on August 22, 1951, with 2% DDT, using 20 pints, or slightly over 1 pint per animal, which averaged 11.0 grams of actual DDT per animal. The material was applied with a power sprayer. Horn fly population was estimated at about 1,800 flies per cow. The cattle were kept in a small hold-up pasture during the test, the same pasture as used in the 1946 test.

About the same general conditions applied to both the 1946 and the 1951 tests, except that in 1946 no other cattle in the area had been treated for horn fly control and in the 1951 test all other cattle in close proximity of the test herd were dipped in DDT the day before the test herd was sprayed.

The original test was applied on May 21, 1946. The fly population then was estimated at 600 flies per animal as compared to 1,800 flies per animal this time. In 1946 the fly population built up to about 25 flies per animal in 19 days and to about 50 flies in 27 days.

In the 1951 test 29 days after spraying there was only slightly over 1 fly per animal. Weather conditions were favorable in both tests for long residual. The principal difference was that there was no exposure to untreated cattle during this test.

A. L. Jackson, Estate, Cooperator
Gainesville, (Alachua County) Florida

In this test 108 large purebred Hereford cattle were sprayed on September 5, 1951, with 1.5% DDT, applied with a power sprayer, at the rate of approximately 1.5 pints per animal, an average of 10.48 grams of actual DDT per animal.

After spraying, the cattle were kept in a 1,000-acre pasture, not the same pasture as used in the 1946 test but similar and in the same area. Large hard-wood trees provided an abundance of shade for the cattle as protection against the hot sun.

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During both tests the cattle were kept in a small improved pasture provided with adequate shade from large oak trees to protect the cattle against hot sun. The weather was very hot and there was not much rain during the test.

R. F. McDonald, Cooperator
Samula, (Volusia County) Florida

Cattle used in this test were rather small grade Angus. Eighteen head were sprayed on August 22, 1951, with 25 DDT, using 20 mints, or slightly over 1 pint per animal, which averaged 11.0 grams of actual DDT per animal. The material was applied with a power sprayer. Both fly population was estimated at about 1,800 flies per cow. The cattle were kept in a small hold-up pasture during the test, the same pasture as used in the 1946 test.

About the same general conditions applied to both the 1946 and the 1951 tests, except that in 1946 no other cattle in the area had been treated for horn fly control and in the 1951 test all other cattle in close proximity of the test herd were dipped in DDT the day before the test herd was sprayed.

The original test was applied on May 21, 1946. The fly population then was estimated at 800 flies per animal as compared to 1,800 flies per animal this time. In 1946 the fly population built up to about 25 flies per animal in 12 days and to about 50 flies in 27 days.

In the 1951 test 25 days after spraying there was only slightly over 1 fly per animal. Weather conditions were favorable in both tests for long residual. The principal difference was that there was no exposure to untreated cattle during this test.

A. L. Jackson, Editor, Cooperator
Gainesville, (Alachua County) Florida

In this test 108 large portland Hereford cattle were sprayed on September 2, 1951, with 1.25 DDT, applied with a power sprayer, at the rate of approximately 1.5 pints per animal, an average of 10.43 grams of actual DDT per animal.

After spraying the cattle were kept in a 1,000-acre pasture, not the same pasture as used in the 1946 test but similar and in the same area. Large hard-wood trees provided an abundance of shade for the cattle as protection against the hot sun.

Fly population at the time of treatment was extremely heavy, averaging about 2,200 flies per animal.

Due to circumstances beyond the control of the cooperator, it was necessary to move the cattle from the test pasture and mix with other cattle on September 26. Therefore, the test was terminated 21 days after treatment.

Inspection and fly counts were made on September 14, September 24, and on September 26, when the cattle were moved. No flies were seen on any of the cattle at any one of these inspections.

In the original test made in 1946, an inspection made 21 days after treatment showed less than 1 fly per animal. In the 1951 test no flies were seen 21 days after treatment. This shows the treatment to be fully as effective now as it was in 1946, even though the test was not carried out to population build-up as it was in 1946, which occurred about 6 weeks after treatment.

P. C. Turner, Cooperator
Umatilla, (Lake County) Florida

This test was not a duplicate of 1946 work. It was done to demonstrate to the cooperator that DDT used according to our recommendations is still an effective and economical control for horn flies.

The cooperator in this test recently complained that DDT did not control horn flies as effectively as it did several years ago when he first started using it. He was advised to use it in 50% wettable powder form at 1.5% concentration and at the rate of about 1 pint per animal.

Failure to get satisfactory results occurred when this cooperator bought a liquid DDT concentrate and mixed it according to the manufacturer's directions, which gave a dilute spray of 0.2%. The user did not figure the concentration of DDT to realize that the fault was in an inadequate quantity of the active ingredient.

In this test 47 grade Angus cattle were sprayed on September 10, 1951. A hand sprayer was used to make the treatment comparable to that done by the owner.

The insecticide used was 50% wettable powder, at a dilution of 1.5% used at the rate of 1 pint per animal, 1.11 grams actual DDT per animal.

Up to September 11, or 11 days after treatment, no flies were seen on the cattle. On September 29, 1 fly to about each 3 cattle were seen and on October 6, or 27 days after treatment, the fly population only averaged about 1 fly per animal. At this time the test was terminated as the owner was convinced that DDT properly used is still effective against horn flies.

Treatments used by the owner earlier this year gave about a week to 10 days' protection which would hardly justify the cost of handling the cattle to spray.

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F. G. Turner, Cooperator
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In this test 17 grade Angus cattle were sprayed on September 10, 1951. A hand sprayer was used to make the treatment comparable to that done by the owner.

The insecticide used was 50% wettable powder, at a dilution of 1.5% used at the rate of 1 pint per animal, 1.11 grams actual DDT per animal.

Up to September 11, or 11 days after treatment, no flies were seen on the cattle. On September 29, 1 fly to about each 3 cattle were seen and on October 6, or 27 days after treatment, the fly population only averaged about 1 fly per animal. At this time the test was terminated as the owner was convinced that DDT properly used is still effective against horn flies.

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